

**SOCIO-ECONOMIC BASELINE DEVELOPMENT
FLORIDA KEYS NATIONAL MARINE SANCTUARY: 1998-2001**

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BACKGROUND

The National Oceanic and Administration's (NOAA) 1995 Draft Management Plan (DMP) for the Florida Keys National Marine Sanctuary (FKNMS) contained a zoning action plan designating 26 zones that restricted consumptive uses. The largest of these zones, the three replenishment reserves, constituted 5.1 percent of the 2,800 square nautical miles of the FKNMS. The Dry Tortugas Ecological Reserve (DTER) was the largest reserve designated under the DMP. Encompassing 37,800 hectares, the zone included the entire distance of the north-south limits of the FKNMS in a location east of the Dry Tortugas National Park (DTNP).

The proposals met with considerable questioning from a variety of sources, and to accommodate the public NOAA chose to employ a designation process for the DTER with enhanced public participation opportunities. Divided into *three* phases, the Tortugas 2000 Planning Process¹ incorporated public input at various levels of development during the three general stages of development (design, solicitation of public information and comment, and final refinements and implementation). All of this commenced in early 1998. *Phase I* consisted of information gathering on the DTER and the development of reserve and boundary alternatives. This phase was completed in mid-1999, when the Sanctuary Advisory Council (SAC) -- a body composed of user group and citizen representatives that provides recommendations on FKNMS regulations and management -- voted on a preferred alternative and recommended it to NOAA and the State of Florida. *Phase II* commenced with the publication of the Draft Supplemental Environmental Impact Statement (DSEIS), followed by public comments on the draft plan. Finally, *Phase III* consisted of the revision of the draft plan and publishing of the final regulations.

PHASE I ACTIVITIES AND SOCIO-ECONOMIC DATA COLLECTIONS

In February 1998, the SAC established a subcommittee to participate in a Working Group that would assist in the development of criteria used in selecting the boundaries and regulations of the proposed DTER. The 24-member group consisted of SAC members and outside experts, and was comprised of agency representatives and members of affected user groups. At its February 1999 meeting, the Working Group drafted a set of criteria to be used

¹ For a summary of the process see "Tortugas 2000" A Collaborative Process To Create An Ecological Reserve in the Florida Keys National Marine Sanctuary. Staff Paper June 1999.

to evaluate proposed boundary alternatives. The FKNMS also organized two information-gathering panels, on the Ecological and Socioeconomic Characterization of the DTER, to provide the Working Group with information on the natural and human dimensions of the region. The Ecological Characterization Forum, held in April 1998, considered the physical characterization, local knowledge, and species of the DTER. The Socioeconomic Characterization Forum, held in June 1998, discussed the various uses of the region and the socioeconomic considerations. In late October and early November 1998, NOAA held five scoping meetings as required under the EIS process (NOAA, 1998). These meetings were designed to provide the public with information on NOAA's intent to designate an ecological reserve in the Dry Tortugas, as well as to gather public comments.

COMMERCIAL FISHERMEN AND THE DTER

The authors entered into a contract with NOAA (9/18/98) to conduct a socioeconomic study on commercial fishermen who utilize the Dry Tortugas region. The average costs of vessel and gear for fishermen within the DTER demonstrate the considerable investment and high expenses involved in fishing the Dry Tortugas. Although the respondents fished a variety of species, they landed only spiny lobster, shrimp, reef fish, and king mackerel from the DTER. The preliminary statistics demonstrated the importance of the DTER to the fishermen that utilize the region. Almost two-thirds of the spiny lobster landed by the sample was caught in the DTER, as well as approximately half of the reef fish.

In addition to the successful Tortugas data collection, a baseline data collection effort also began in 1998 and 1999. The effort completed over the first three years has been concerned with the initiation of a harvest data baseline for use in assisting NOAA evaluation of potential impacts on commercial fisheries of the DTER. The baseline documentation was initiated also in other areas of Monroe County to construct a data set capable of future monitoring of the FKNMS related commercial fisheries in the region.

The information collected by this project was to complement the ecological monitoring program and was intended to be long-term. The monitoring effort consisted of two data sets:

1. The establishment of four commercial fishing "panels" consisting of fishermen with active Saltwater Product Licenses (SPLs) in Monroe County:
 - "Tortugas" fishermen with active SPLs that currently fished in the area generally known as the Dry Tortugas [as referenced by the Florida Marine Research Institutes (FMRI) statistical grids 2.0 and 2.9 for gathering information through the trip ticket program].
 - "Sambos" fishermen with active SPLs that currently that fished the "Sambos Ecological Reserve" (Sambos) prior to July 1997.
 - "General" fishermen with active SPLs who did not fish in areas which were the subject of immediate management proposals by the FKNMS; i.e. those who fished

neither within the Dry Tortugas; Sanctuary Preservation Areas (SPAs); or, the Sambos Ecological Reserves.

- Fishermen with active SPLs who were Marine Life Collectors.

The fishermen selected were believed to be representative of the commercial fishermen in Monroe County. Based upon information they have made available, the annual information includes: total catch in pounds by species, total revenue generated by species, cost of fishing, net earnings from fishing and related socio-economic information.

2. Monitoring also was to include: the compiling of information on the overall commercial fishery for the entire State of Florida and for Monroe County, Florida. Those comparative measures include:

- Numbers of SPLs in Monroe County and the State of Florida.
- Harvest (measured in pounds), ex-vessel value of landings, number of fishing trips for total landings by species and area of catch, for both Monroe County and the State as a whole, from the State of Florida's Trip Ticket Information System on an annual basis.²
- Number of lobster and stone crab traps for Monroe County and the State of Florida.
- Number of vessels and boats in the commercial fishery of Monroe County and the State of Florida.

The goal of the assessments is to compare trends in the various measures of commercial fishing at both the County and the State levels. Ideally long-term comparisons of the activities of the panels, with the overall situation in Monroe County and the State, will allow some inference as to the impacts of regulations and other activity in the FKNMS.

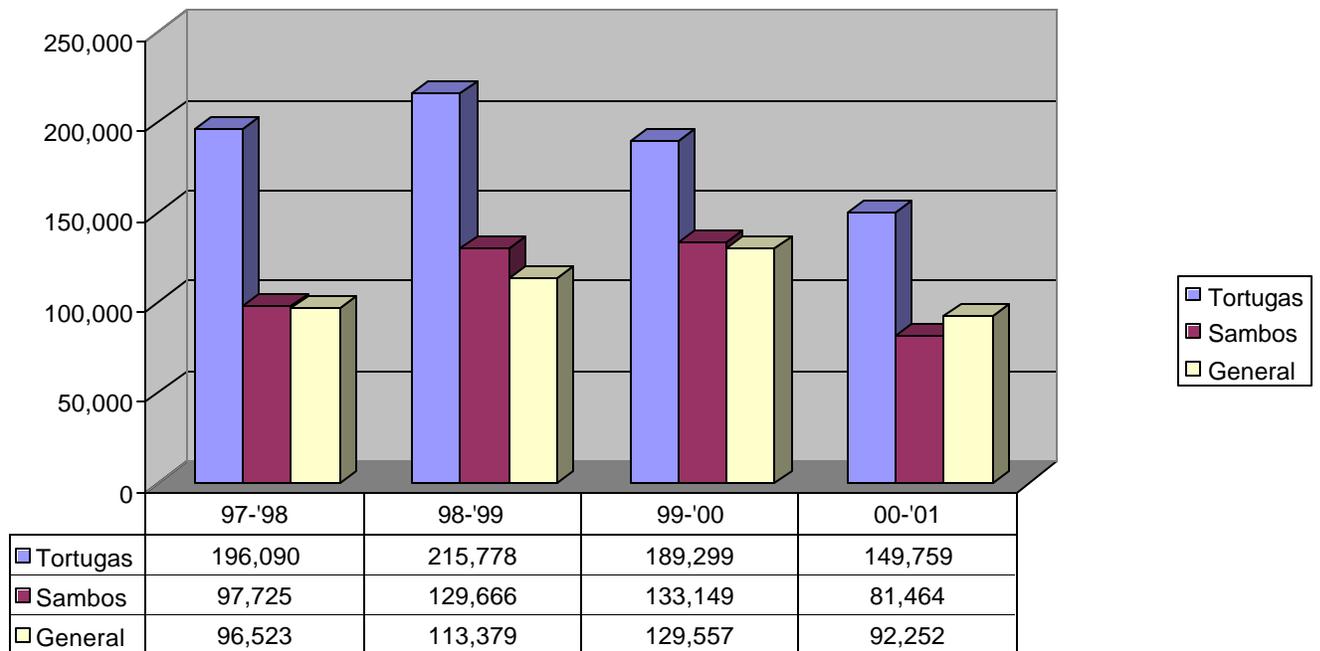
The panels are to provide the beginning of a monitoring mechanism from which future positive or negative changes related to displacement from Sanctuary zones could be quantified. Such analysis was understood to be beyond the scope of this initial documentation and would necessarily involve more detailed information on other factors not related to the Sanctuary's management, such as input cost and market factors, other state and federal fishery regulations, etc. It was also recognized in these formative years, that analyses would be very limited since it would require several years of monitoring information before reasonable assessments could be conducted.

² Catch by area from the FMRI includes statistical grids: 1.0, 1.1, 1.9, 2.0, 2.9, 3.0, 3.1, 3.2, 3.9, 748, 748.1, and 748.9 for Monroe County. The quality of this data has varied over time and improved over the recent past. Most recent data on landings includes 99% of the commercial catch being identified by reporting grid.

COMMERCIAL FISHING PANELS

The annual data obtained from interviews with the commercial fishing panels summarized below allows some comparison between the various regions to be benchmarked.

**FISHING YEAR COMPARISONS IN AVERAGE TOTAL HARVEST VALUE BY PANEL
TORTUGAS, SAMBOS, GENERAL -- '97-'01**



COMMERCIAL FISHING PANELS ¾ YEAR ONE

1997-1998 Fishing Year ^{3,4} — <i>Tortugas</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/SG	\$246,210	\$148,615	\$97,596	\$125,000	\$52,000
Shrimp	212,835	177,090	35,745	300,000	9,100
SG	50,761	34,282	16,479	80,000	12,000
LB/SC/SG	159,235	83,905	75,330	150,000	30,250
LB/SC/SG	341,500	261,400	80,100	225,000	105,500
LB	166,000	99,798	66,202	100,000	37,000
Average⁵	\$196,090	\$134,812	\$61,909	\$163,333	\$40,975
1997-1998 Fishing Year — <i>Sambos</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$99,700	\$65,190	\$34,510	\$85,000	\$66,500
LB/SG/Mack	116,000	37,033	78,967	133,333	96,667
SG	143,300	106,275	37,025	175,000	114,475
LB/SC/SG	92,000	98,170	(-6,170)	270,000	88,000
LB/SC/SG	41,300	23,260	18,040	30,000	14,000
LB	94,050	90,070	3,980	140,000	39,750
Average	\$97,725	\$70,000	\$27,725	\$138,889	\$69,899
1997-1998 Fishing Year — <i>General</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$133,335	\$90,070	\$43,265	\$85,000	\$65,500
LB/SG	47,600	27,500	20,100	35,000	25,200
SG	65,910	52,672	13,238	90,000	54,000
LB/SC/SG	76,560	63,792	12,768	40,000	49,500
LB/SC/SG	66,400	52,300	14,100	50,000	60,000
SG/Shark	189,332	107,970	81,362	120,000	30,000
Average	\$96,523	\$65,717	\$30,806	\$70,000	\$47,367
1997-1998 Fishing Year — <i>Collectors</i>					
Type Harvester	Harvest Total (#) ⁶	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Tropicals	74,000	\$8,800	N/A	\$23,000	\$5,000
Tropicals	32,800	\$7,500	N/A	\$40,000	\$60,000
Tropicals	86,000	\$8,250	N/A	\$100,000	\$6,000
Average	#48,200	\$6,138	N/A	\$40,750	\$17,750

³ The first year of socio-economic monitoring effort commenced in September 1998. On September 25, 1998 "Hurricane Georges" struck Monroe County (Florida Keys) causing widespread damage and economic dislocation in the study area. As a result, the first year surveys represent annual catch totals for the prior (1997) calendar year while much of the costs associated with spiny lobster and stone crab gear maintenance reported, are considered atypical as the storm struck at the peak of the lobster season and just prior to crab season inflicting heavy damage on the fixed gear deployed in the fishery.

⁴ For Fishing Year One and Two charts *Type of Harvester* -- LB=spiny lobsters, SC= stone crab, Mack = Spanish mackerel and king mackerel, SG= reef fish

⁵ Where fisherman owns more than one vessel all records reflect the average per vessel.

⁶ The collectors surveyed reported numbers versus (\$) of tropical or marine life species harvested.

COMMERCIAL FISHING PANELS ¾ YEAR TWO

1998-1999 Fishing Year — Tortugas					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Lb/SC/SG	\$301,640	\$168,400	\$133,640	\$125,000	\$50,000
Shrimp	160,800	131,960	28,840	300,000	9,000
SG	126,800	105,048	21,752	150,000	12,000
LB/SC/SG	134,930	92,379	42,551	100,000	32,500
LB/SC/SG	398,100	421,172	(-23,072)	400,000	121,000
LB	172,400	147,400	25,000	235,000	38,000
Average⁷	\$215,778	\$177,726	\$38,118	\$218,333	\$43,750
1998-1999 Fishing Year — Sambos					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$137,500	\$91,586	\$45,914	\$80,000	\$60,000
LB/SC/Mack	212,655	102,296	110,358	133,000	97,000
LB/SC/Mack	146,500	97,560	48,940	200,000	146,000
LB/SC/SG	117,495	107,042	10,453	300,000	134,000
LB	64,650	30,000	34,650	30,000	17,600
LB/SC	96,200	71,036	25,164	100,000	24,000
Average	\$129,666	\$83,253	\$45,913	\$140,500	\$79,766
1998-1999 Fishing Year — General					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$135,425	\$87,800	\$47,625	\$90,000	\$153,000
LB/SC	90,500	58,850	31,650	35,000	52,500
LB/SG	101,200	80,660	20,540	90,000	52,500
LB/SC	89,600	72,200	17,400	40,000	49,000
LB/SC/Mack	76,050	56,500	19,550	45,000	43,500
SG/Shark	187,500	98,800	88,700	120,000	30,000
Average	\$113,379	\$75,801	\$37,577	\$70,000	\$63,416
1998-1999 Fishing Year — Collectors					
Type Harvester	Harvest Total (#) ⁸	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Tropicals	85,000	\$7,200	N/A	\$23,000	\$5,000
Tropicals	N/A	N/A	N/A	N/A	N/A
Tropicals	N/A	\$8,250	N/A	\$100,000	\$5,000
Average	NA	NA	N/A	NA	NA

⁷ Where fisherman owns more than one vessel all records reflect the average per vessel.

⁸ The collectors surveyed reported numbers versus (\$) of tropical or marine life species harvested.

COMMERCIAL FISHING PANELS ¾ YEAR THREE

1999-2000 Fishing Year - <i>Tortugas</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Lb/SC/SG	\$340,413	\$184,974	\$155,439	\$150,000	\$38,500
Shrimper	184,075	172,600	\$11,475	300,000	12,000
SG	122,774	114,470	\$8,304	170,000	10,000
LB/SC/SG	149,530	102,379	\$47,151	100,000	32,500
Lb/SC/SG	188,100	128,172	\$59,928	400,000	121,000
Shrimper	158,086	124,725	\$33,361	300,000	25,000
LB	\$182,118	\$167,800	\$14,318	\$225,000	\$38,000
Average⁹	189,299	142,160	\$47,139	235,000	39,571
1999-2000 Fishing Year - <i>Sambos</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$192,295	\$102,296	\$89,999	\$133,000	\$97,000
LB/SG/Mack	196,445	109,560	86,885	200,000	146,000
LB/SC/Mack	117,495	107,000	10,495	300,000	134,000
LB/SC/Mack	98,107	104,158	(-6,051)	350,000	173,710
LB	87,900	38,500	49,400	30,000	17,600
LB/SC	106,650	71,036	35,614	100,000	24,000
Average	\$133,149	\$88,758	\$44,390	\$185,500	\$98,718
1999-2000 Fishing Year - <i>General</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC	\$178,437	\$96,200	\$82,237	\$80,000	\$146,200
LB/SC	108,980	77,656	31,324	40,000	59,600
LB/SG	91,205	75,886	15,319	90,000	52,500
LB/SC	142,970	108,450	34,520	120,000	70,000
Lb/SC/Mack	76,050	56,500	19,550	45,000	43,500
SG/Shark	179,700	123,980	55,720	88,000	35,000
Average	\$129,557	\$89,779	\$39,778	\$77,167	\$67,800
1999-2000 Fishing Year - <i>Collectors</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Tropicals	\$34,980	\$16,780	\$18,200	\$35,000	\$10,000
Tropicals	60,428	14,900	45,528	40,000	60,000
Tropicals	18,980	2,700	16,280	100,000	6,000
Tropicals	27,900	16,300	11,600	25,000	2,500
Tropicals	17,500	12,460	5,040	80,000	8,000
Average	\$31,958	\$12,628	\$19,330	\$56,000	\$17,300

⁹ Inter-annual comparisons of total harvest value for the Tortugas panel are limited due to the expansion of the number of shrimp operations in the Tortugas area during year three.

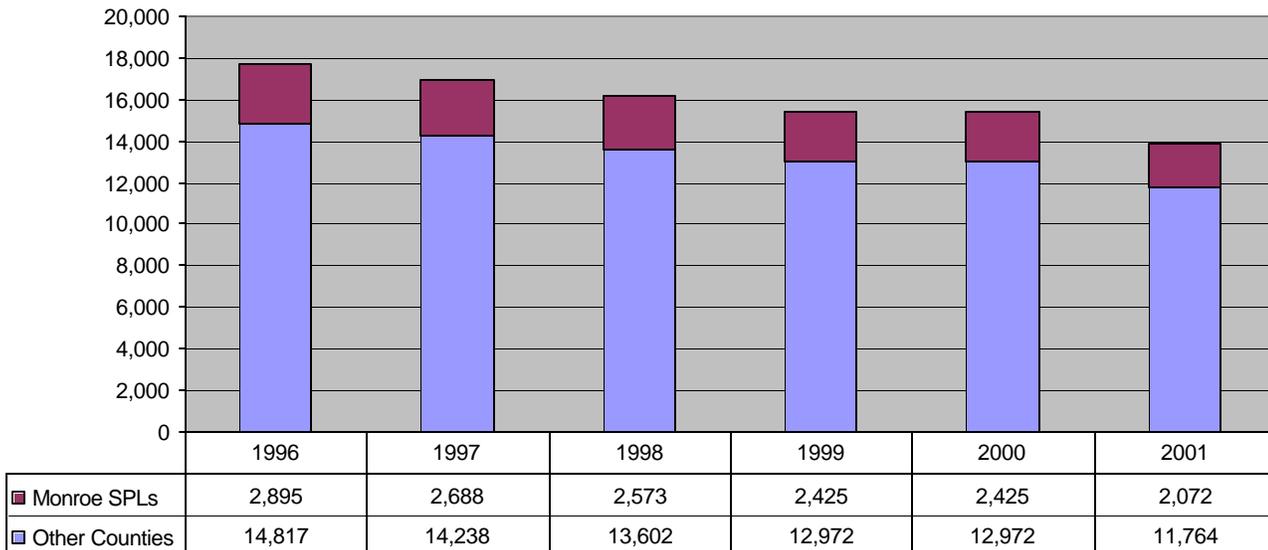
COMMERCIAL FISHING PANELS ¾ YEAR FOUR

2000-2001 Fishing Year - <i>Tortugas</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Lb/SC/SG	\$305,946	\$214,974	\$90,972	\$200,000	\$37,500
Shrimper	173,950	159,460	14,490	270,000	12,000
SG	108,470	100,656	7,814	175,000	12,000
LB/SC/SG	129,671	113,800	15,871	100,000	32,500
Lb/SC/SG	168,760	135,920	32,840	300,000	121,000
Shrimper	156,475	125,180	31,295	250,000	25,000
LB	154,800	115,570	39,230	225,000	38,000
Average	\$149,759	\$120,695	\$29,064	\$190,000	\$34,750
2000-2001 Fishing Year - <i>Sambos</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC/Mack	\$115,300	\$81,224	\$34,076	\$133,000	\$100,000
LB/SG/Mack	139,475	77,548	61,927	200,000	160,000
LB/SC/Mack	111,620	100,650	10,970	275,000	110,000
LB/SC/Mack	66,712	64,980	1,732	300,000	120,000
LB	70,340	30,650	39,690	20,000	20,000
LB/SC	66,800	59,100	7,700	100,000	22,000
Average	\$81,464	\$59,165	\$22,299	\$146,857	\$76,000
2000-2001 Fishing Year - <i>General</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
LB/SC	\$163,083	\$87,587	\$75,496	\$40,000	\$146,200
LB/SC	65,388	65,711	(-323)	40,000	50,000
LB/SG	62,019	49,615	12,404	90,000	52,500
LB/SC	139,445	115,665	23,780	70,000	70,000
Lb/SC/Mack	67,534	61,676	5,858	45,000	40,000
SG/Shark	148,292	118,720	29,572	80,000	35,000
Average	\$92,252	\$71,282	\$20,970	\$52,143	\$56,243
2000-2001 Fishing Year - <i>Collectors</i>					
Type Harvester	Harvest Total Value	Harvest Total Cost	Harvest Net Earnings	Replacement Cost Vessel	Replacement Cost Equipment
Tropicals	\$38,680	\$18,220	\$20,460	\$25,000	\$8,000
Tropicals	78,501	19,380	59,121	30,000	60,000
Tropicals	12,880	2,060	10,820	100,000	9,000
Tropicals	22,945	13,410	9,535	40,000	3,500
Tropicals	27,650	19,062	8,588	70,000	12,000
Average	\$30,109	\$12,022	\$12,022	\$44,167	\$15,417

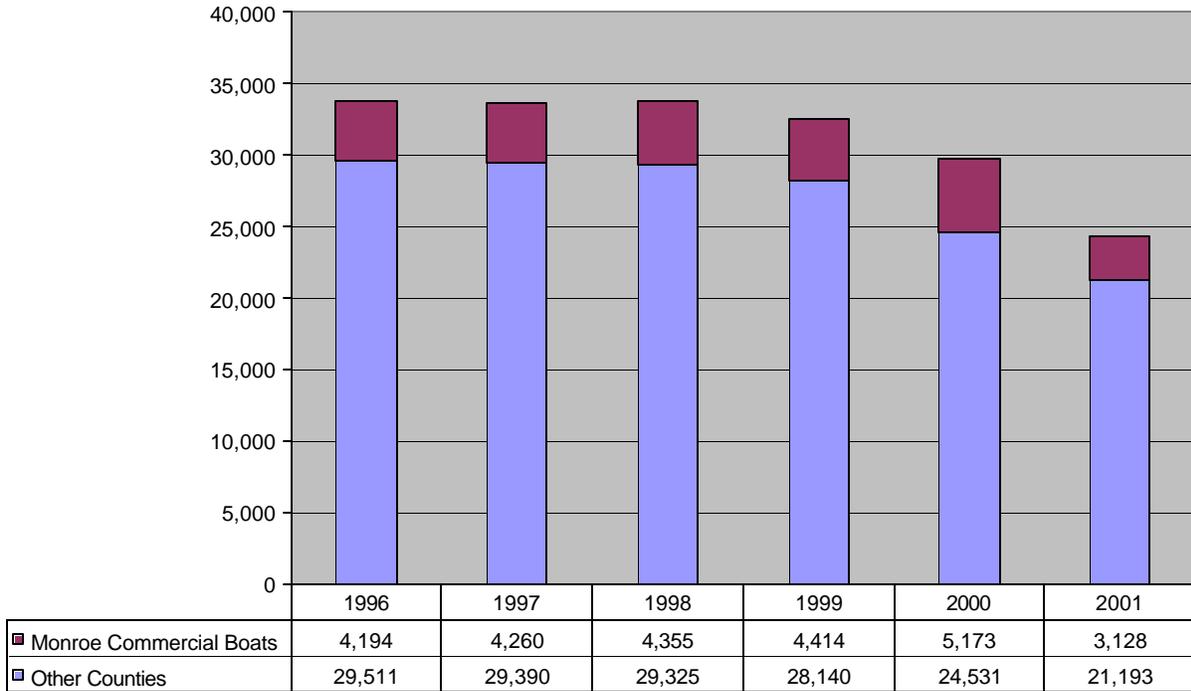
FISHING PRODUCTION AND EFFORT COMPARISON INDICATORS BETWEEN THE STATE OF FLORIDA AND MONROE COUNTY

Until the 2001 reporting year, Monroe County had maintained its commercial fishing landings compared to the state of Florida. During the latter part of the 1990's Florida commercial fishery landings in other counties have declined about 16% from 121.5 million lbs. in 1996, to 99.6 million lbs. in 1999. Over the same period, Monroe catches declined about 7% in weight from 23.8 million lbs. in 1996, to 20.8 million lbs in 1999. Over the same period, the landed value of catches in Florida overall have declined by about 5%, while Monroe County catches actually *increased* in total value by about 23%. The importance of higher value shellfish such as lobster, stone crabs and shrimp had insulated the Keys fishermen from the adverse trend overall in Florida commercial fisheries. Between 2000 and 2001, Monroe Counties total landings declined by 24% from 18.1 million lbs. to 13.9 million pounds in 2001.

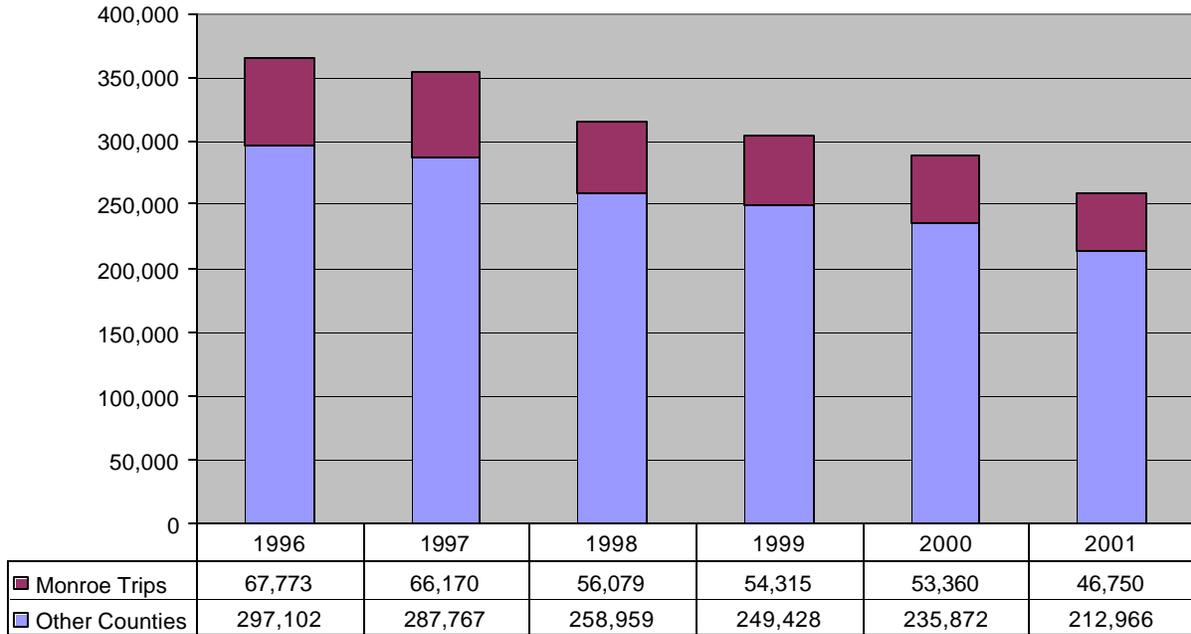
NUMBER OF SALTWATER PRODUCTS LICENSES
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES



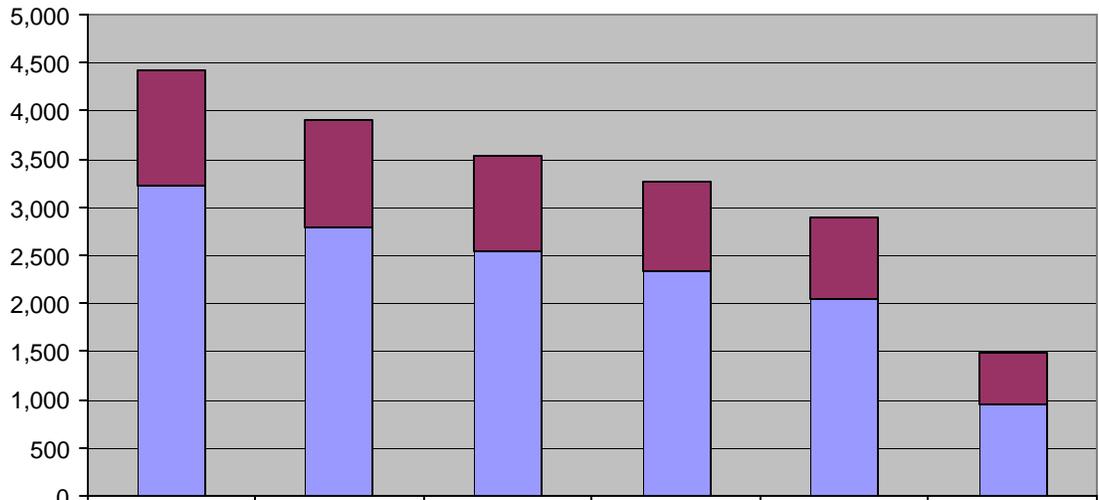
**TOTAL NUMBER OF COMMERCIAL VESSELS AND BOATS
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**



**TOTAL NUMBER OF COMMERCIAL FISHERY TRIPS
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**

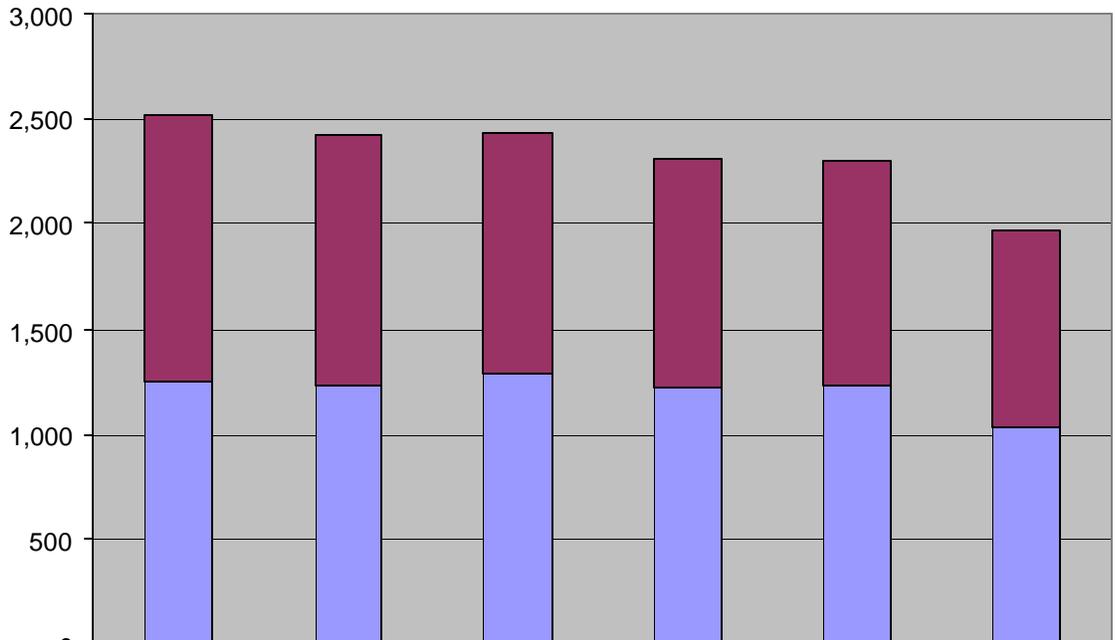


**TOTAL NUMBER OF STONE CRAB PERMITS
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**



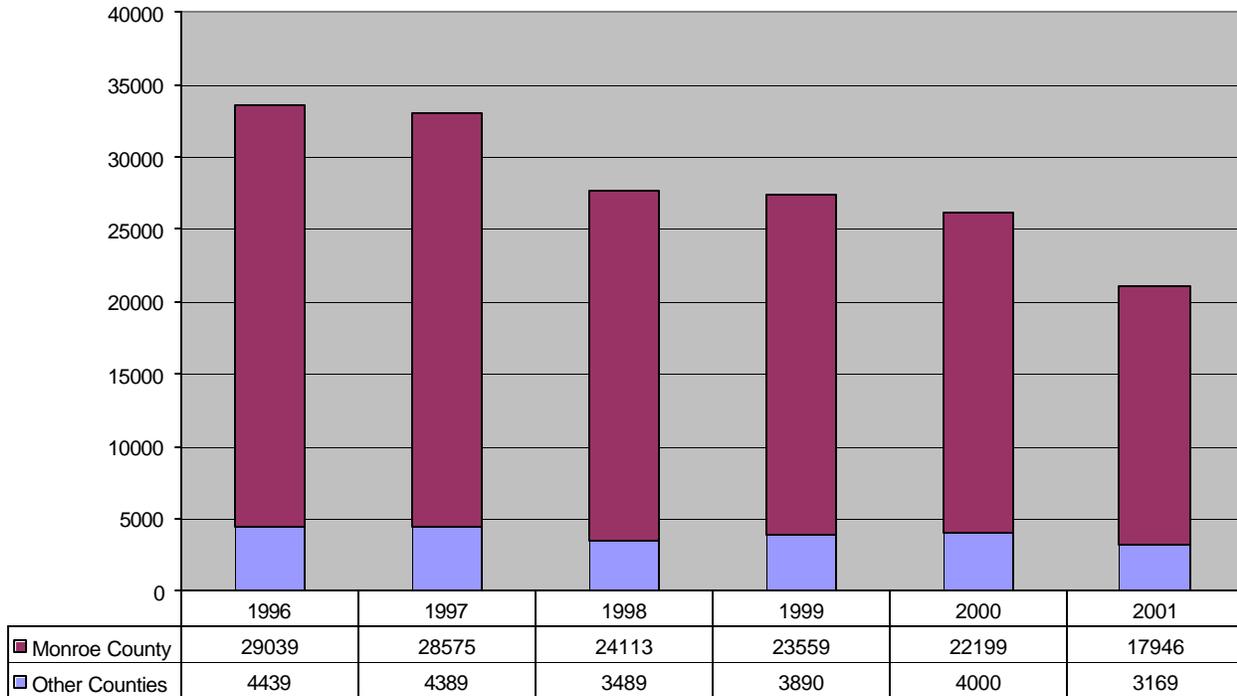
	1996	1997	1998	1999	2000	2001
Monroe Stone Crab Permits	1,198	1,098	992	921	833	536
Other Counties	3,224	2,794	2,537	2,340	2,048	949

**TOTAL NUMBER LOBSTER PERMITS
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**



	1996	1997	1998	1999	2000	2001
Monroe Lobster Permits	1,270	1,192	1,150	1,093	1,066	925
Other Counties	1,250	1,231	1,282	1,215	1,233	1,039

**TOTAL NUMBER OF LOBSTER FISHERY TRIPS
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**



LOBSTER PRODUCTION AND FISHING EFFORT LOCATION

The major intent of the development of a commercial fisheries panel index is to be able to track changes in industry productivity, relative to changes in management practices associated with the implementation of the FKNMS. Given the primary importance of the spiny lobster fishery to the Key West and lower Keys, area comparisons of trends in catches, effort and crude average catch per unit effort, illustrate the approach to indicator assessments of management impacts.

The 1997 fishing year was the subject year of the “Tortugas 2000” preliminary estimate of the commercial fishery in Monroe County; and, as was pointed out in the evaluations, the 1997 landings by area provided a good baseline for assessing total catch and landings from the Tortugas area (statistical grids 2.0 and 2.9 in the FMRI data).¹⁰

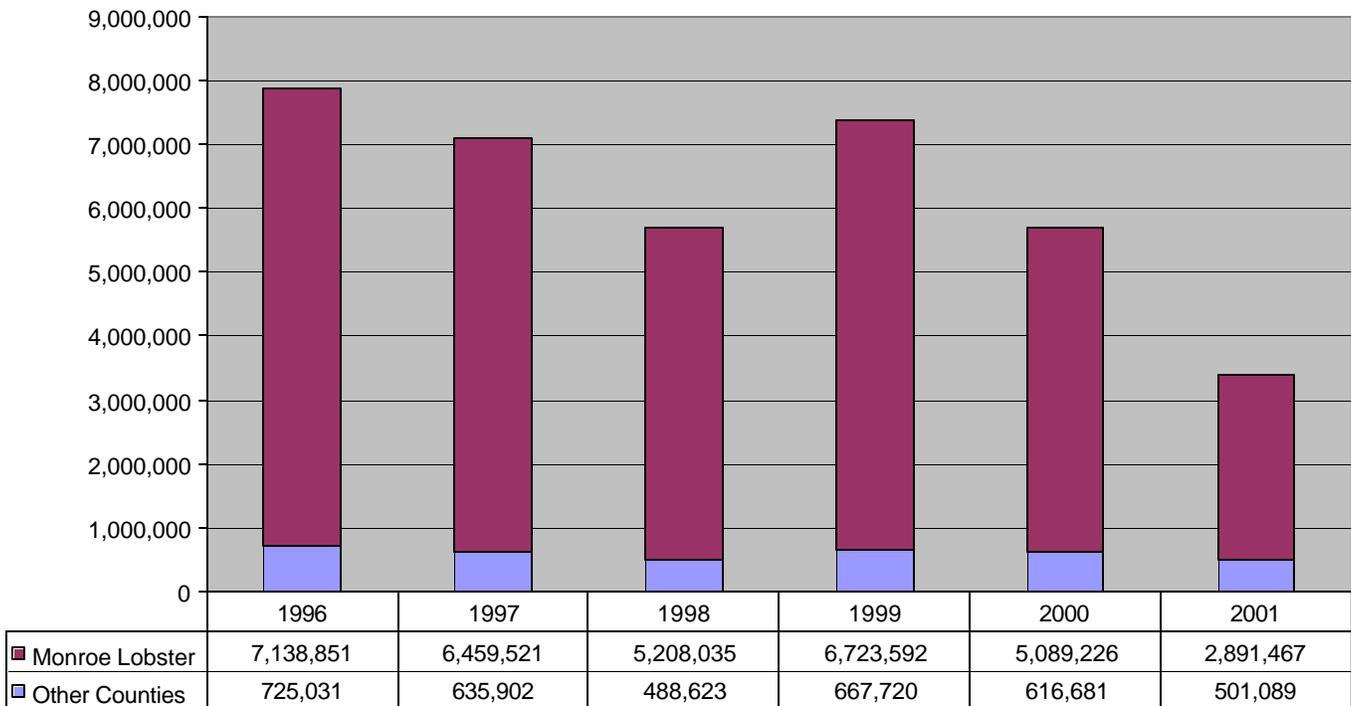
As was initially pointed out, the monitoring began in the fall of 1998 and was coincidental to two major hurricane events. Review of the three years landing trends below probably reflects those losses in harvest during the peak production months following the storm. The

¹⁰ “Preliminary Estimates of the Market Economic Values of the Commercial Fishery of Monroe County Potentially Impacted By the Proposed Tortugas Ecological Reserve of the Florida Keys National Marine Sanctuary. Dr. V.R. (Bob) Leeworthy NOAA Strategic Assessments Division. December 1998. According to the report 1997 landings were virtually all (99.9%) reported by FMRI statistical collection area and thus began a reasonable time-series of regional landings data for monitoring purposes. The report observed that previously such data was questionable with 61% of the landings location data in 1994, 27% in 1995 and 4% in 1996 being listed as “unknown”.

summary graphics depict the catch, effort and a crude measure of average productivity in the appropriate Florida statistical collection areas relevant to the Sambos and Tortugas area.

Increasing yields to the fishery in the local region were experienced in the period 1997-1999 for each statistical area. Since the peak harvest in 1999, lobster production has declined significantly throughout the Keys. Between 2000 and 2001 harvest fell by 43 %.

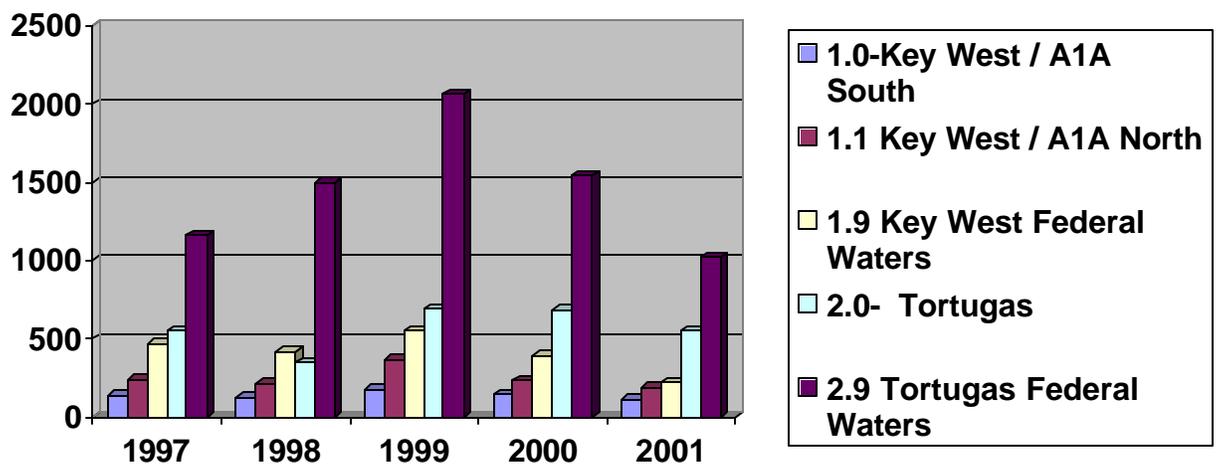
**TOTAL LOBSTER HARVEST (Lbs.)
FOR MONROE COUNTY AND OTHER FLORIDA COUNTIES**



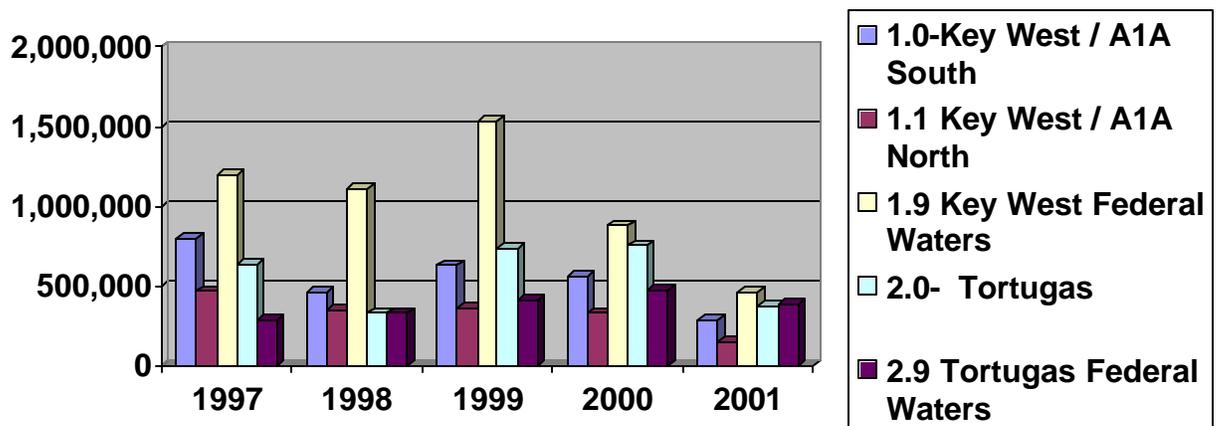
There were significant changes in lobster fishing effort throughout the Key West collection areas between 2000 and 2001. The number of lobster trips in collection area 1.0 (South of A1A) declined by 32%; landings from the zone declined by 51% over the period; and the catch per trip decreased by 25%. In the area North of A1A, the number of trips fell by 43%; and lobster harvest declined by 56%, resulting in a reported decrease of 20% in landings per trip. Over this period the area 1.9 (Key West Federal Waters) saw a 3% decrease in lobster trips reported, accompanied by a 47% decrease in landings with a resulting decrease in average catch per trip for the zone of 43%.

For the Tortugas area 2.0 the lobster harvest decreased over the same period by 50%, the number of trips declined by 36% and the resulting average catch per trip declined by 20%. Collection area 2.9, the Tortugas Federal Waters saw a 18% decrease in catch reported from the zone while there was a reported 28% *increase* in the number of lobster trips resulting in a decrease in lobster catch per trip of 34%.

Lobster Catch Per Trip By Collection Area



Total Lobster *Catch* By Collection Area



Number of Lobster *Trips* by Collection Area

